



*A being who is three Persons while remaining one Being,  
just as a cube is six squares while remaining one cube.*

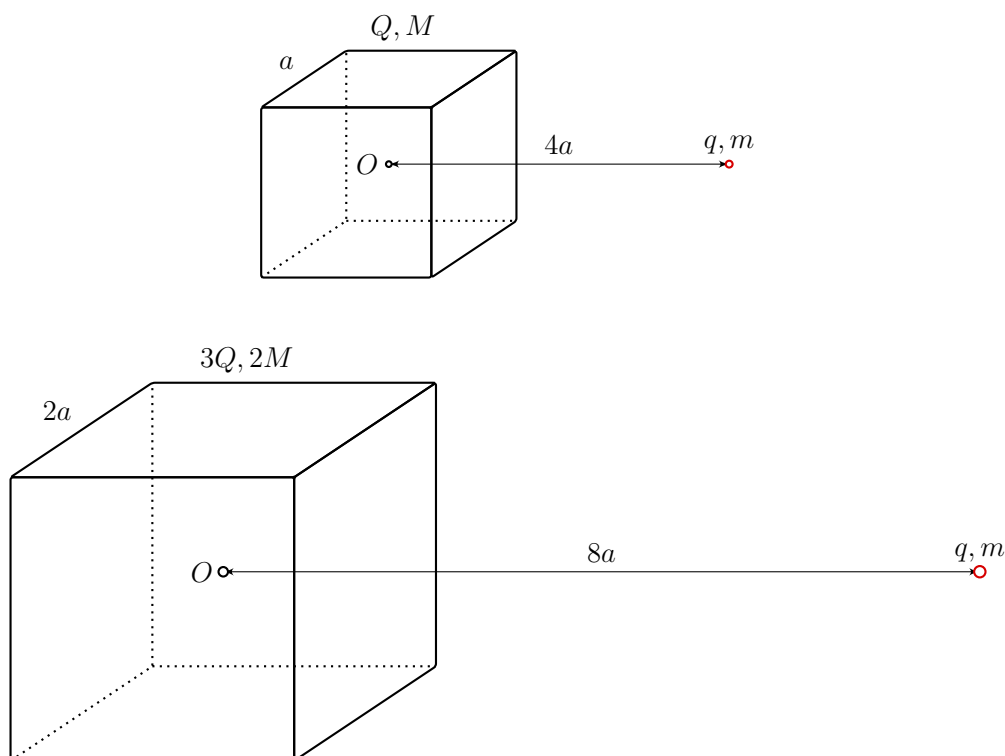
*Clive Staples Lewis*

## Cube in a cube

At a distance of  $4a$  from a solid Cube uniformly charged over the volume with side  $a$ , and charge  $Q$ , a point-charge  $q$  is located on a line passing through the center of the Cube and the center of one of its faces (see fig.). The Cube's mass is  $M$ , the mass of the charge is  $m$ . The initial velocities of the Cube and the charge are zero. The Cube and the charge are released, as a result of which the distance between them changes twice in time  $t$ .

Find the time it takes to change the distance twice between the same point-charge and uniformly charged Cube with side  $2a$ , charge  $3Q$ , and mass  $2M$ , if the charge is located on a line passing through the center of the Cube and the center of one of its faces at a distance of  $8a$  (see fig.). The initial velocities of the Cube and the charge are zero.

*Note.* The distance between the Cube and the point-charge is measured from the center of the Cube. Neglect gravitational and magnetic interactions.



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First hint — 10.05.2021 14:00 (GMT+3)

Second hint — 12.05.2021 14:00 (GMT+3)

End of the second tour — 14.05.2021 22:00 (GMT+3)